



Brief communication

## Contrast-enhanced computed tomography detection of occult breast cancers presenting as axillary masses

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### Summary

Some non-palpable breast cancers presenting as axillary metastases (occult breast cancer, OBC) are not clinically detectable by either mammography (MMG) or ultrasonography (US). We performed contrast-enhanced computed tomography (CE-CT) in order to locate the primary tumors in five cases of OBC and succeeded in locating all of them.

### Introduction

Non-palpable breast cancer presenting as an axillary metastasis (occult breast cancer, OBC) is uncommon, accounting for less than 1% of all breast cancers [1]. Malignant neoplasms other than breast carcinoma that metastasize to axillary nodes are quite rare in the absence of signs and symptoms of the primary lesions. Therefore, metastatic adenocarcinoma in the axillary nodes usually originates from a primary tumor in the ipsilateral breast, which may not be clinically detectable. Only one-fourth of clinically OBCs are demonstrable by mammography (MMG) or ultrasonography (US) of the breast [2]. Between November 1995 and March 1998, we experienced five consecutive OBCs, and contrast-enhanced computed tomography (CE-CT) disclosed the location of the tumor in all cases.

### Case reports

The five cases of OBC are shown in Table 1. The patients' ages at onset were 49, 60, 64, 65, and 66 years, respectively. The mean diameter of the axillary mass was 2.2 cm. No breast mass could be detected by palpation or MMG (Mammomat 3, Siemens).

MMG and CE-CT imagings were evaluated prospectively by two radiologists (K.M. and N.U.). In patient No. 2, MMG revealed dense breast and US (EUB-515, Hitachi) demonstrated three breast tumors with a maximum diameter of 1 cm, suggesting primary cancer. CE-CT (X-Vigor, Toshiba) was performed using a 3-mm slice thickness with the patients in the supine position, as reported previously [3, 4], and disclosed in each case a moderately enhanced lesion in the ipsilateral breast, suggestive of a primary lesion [5], which was outlined by marking on the skin (Figure 1). Even for the smallest tumor in Case 5, although the enhancement was too weak to diagnose breast cancer, gland distortions detected by CE-CT suggested the tumor location, enabling us to mark its position on the skin. Extramammary primary tumors were ruled out by chest X-ray, upper GI series, thyroid US, and a gynecological survey in all patients, and biopsy and/or aspiration cytology of the axillary nodes confirmed adenocarcinoma in all cases. Biopsy or mastectomy revealed breast cancers below the skin markings in every case. The invasive elements ranged from 0.1 to 1.0 cm in diameter, similar to the size of the enhanced areas on CE-CT. All the tumors were histological grade 2 or 3, but overexpression of p53 and c-erbB-2 protein was observed in only one of the four cases evaluated. In Case 5 the tumor was too small

Table 1. Clinicopathological characteristics of occult breast cancers

Case	Age	Ax size (cm)	MMG	US	CT size (cm)	Pathology	Path size (cm)	Size (invasion) (cm)	HG	p53	c-erbB-2	Iy/v	n	ER/PgR
1	66	2.0	UD	UD	1.0	ILC + LCIS	3.1	0.7	2	-	-	-/-	33/33	+/+*
2	49	1.5	UD	D	1.0	IDC	1.0	1.0	2	-	+	+/-	5/8	+/+
3	64	1.0	UD	UD	0.6	IDC + P	1.5	0.4	3	-	-	-/-	4/15	+/-
4	65	4.0	UD	UD	0.6	IDC	0.5	0.5	3	++	-	-/-	1/1	-/-
5	60	lt 2.5 rt 1.5	UD	UD	Distortion	IDC + P	0.3	0.1	3	NT	NT	-/-	18/20	-/-**

\*Immunohistochemical study.

\*\*EIA study of a metastatic axillary lymph node.

Ax = Axillary lymph node; path size = pathological diameter including intraductal component;  
size (invasion) = pathological diameter of invasive component; HG = histological grade; Iy/v = lymphatic/vascular permeation by tumor cells; n = number of  
pathological lymph node metastases; UD = undetectable; D = detected; ILC + LCIS = invasive lobular carcinoma with a predominant lobular carcinoma *in situ*  
component; IDC = invasive ductal carcinoma; IDC + P = invasive ductal carcinoma with a predominant intraductal component; lt = left; rt = right; NT = not tested.

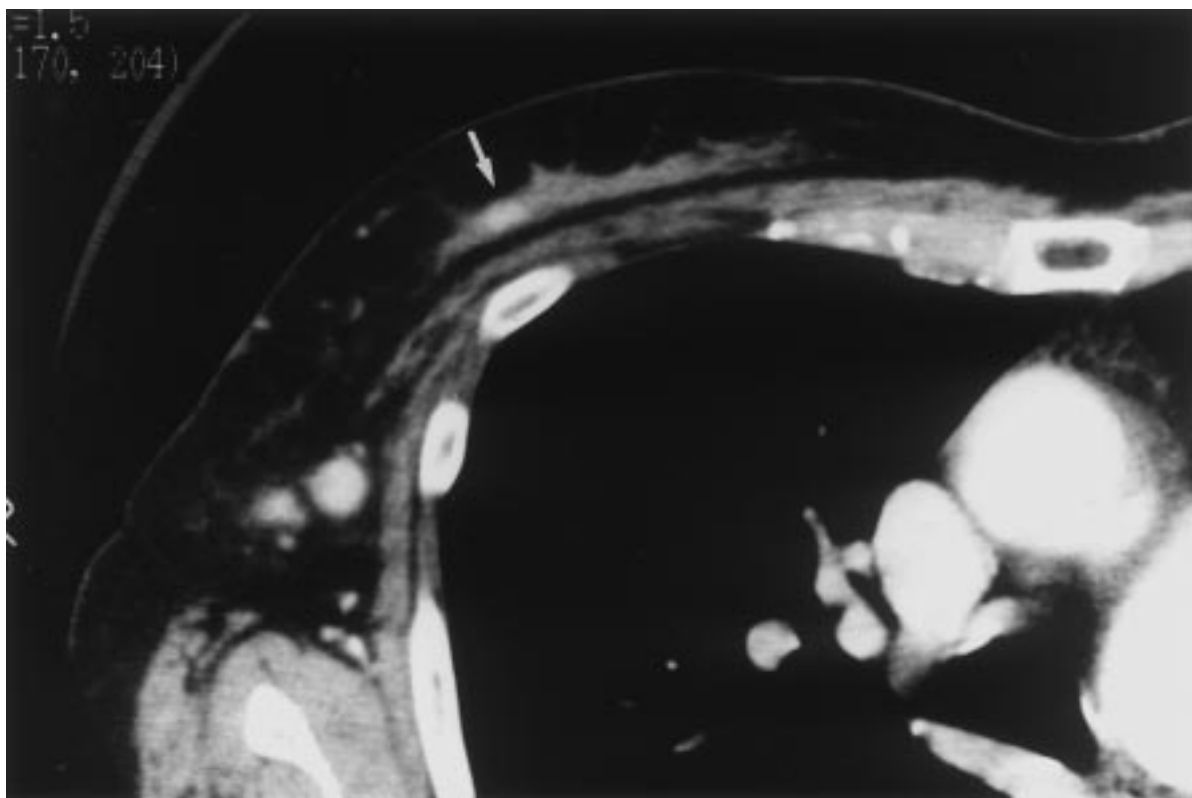


Figure 1a. A CE-CT image of the right breast in Case 1. A moderately enhanced area 1 cm in diameter at the outer part of the mammary gland (arrow) and axillary lymph node swellings is shown. Histopathologically, this lesion was invasive lobular carcinoma with a predominant lobular carcinoma-in situ component.

for immunohistochemical study. In all cases, extensive involvement of the axillary nodes was noted, although the invasive lesions were small.

## Discussion

We have previously reported the usefulness of CE-CT for identifying the extent of the intraductal component of breast carcinoma when breast-conserving treatment is to be performed [4]. CE-CT can similarly demonstrate small invasive lesions in otherwise OBCs. Kyokane reviewed 97 OBCs and indicated the low detectability of the primary tumors by MMG and US [2]. The excellent spatial resolution of CE-CT can localize such small tumors even in dense breast.

Enhancement shown by CE-CT is due to angiogenesis and an enlarged interstitial space accompanying the carcinoma [4]. A similar report documented a case

of OBC or in which an 8-mm infiltrating lobular carcinoma was detected by magnetic resonance imaging (MRI)[6]. CE-CT is less expensive and has a more rapid scan time than MRI, and the images obtained in the supine position used during surgery are a great advantage.

The biological characteristics of OBC are of interest. The risk of node involvement in microinvasive breast cancer is considered to be low [7]. Known markers of biological aggressiveness such as histological grade p53 and *c-erbB-2* gene products [8] were non-contributory in the present cases, as has been reported previously [9]. Some unknown factors which determine the affinity of cancer cells for lymph nodes must be sought. These breast cancers with small invasive foci might not develop into clinically palpable tumors [10], and some reports have stated that the survival rate of the patients does not decrease when the breast is left untreated [11]. Identification of primary cancers preoperatively by CE-CT facilit-

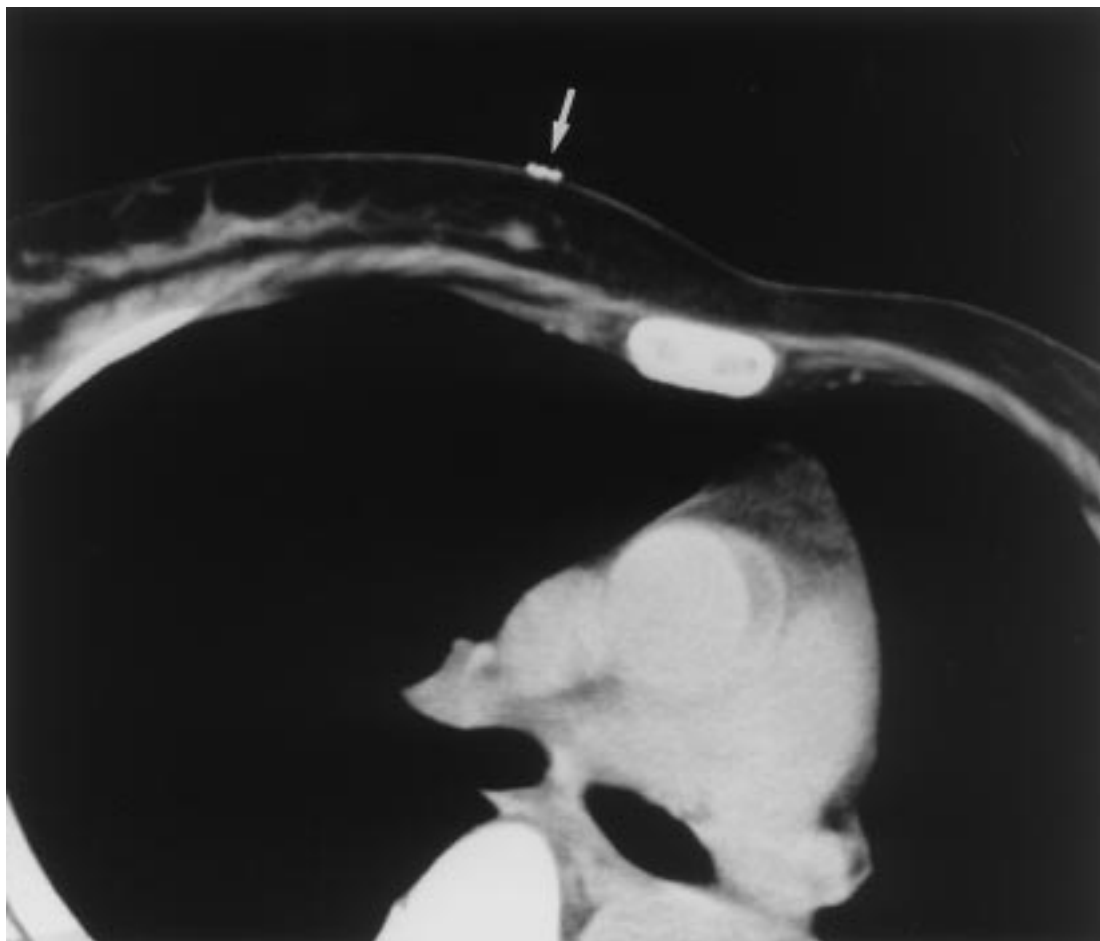


Figure 1b. A CE-CT image of the right breast in Case 4. An enhanced mass lesion 0.6 cm in diameter in the upper inner quadrant was isolated from the left atrophic mammary gland. A skin marking is shown just above the lesion (arrow). Excisional biopsy revealed invasive ductal carcinoma, histological grade 3, 0.5 × 0.4 cm in diameter.

ates both breast-conserving treatment and appropriate specimens.

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